

1 1. An apparatus for reading data, comprising:
2 a magnetic tape media contact surface configured to
3 contact a magnetic tape media; and
4 a reduced sensitivity spin valve sensor, wherein the
5 reduced sensitivity spin valve sensor senses an applied
6 magnetic field from the magnetic tape media when the
7 magnetic tape media passes by the reduced sensitivity
8 spin valve sensor, and wherein the reduced sensitivity
9 spin valve sensor has a sensitivity less than magnetic
10 disk head spin valve sensors

3. The apparatus of claim 1, wherein the reduced sensitivity spin valve sensor has a sensitivity that is reduced from a sensitivity of the magnetic disk head spin valve sensor by increasing a thickness of a free layer of a magnetic disk head spin valve sensor.

1 4. The apparatus of claim 1, wherein the reduced
2 sensitivity spin valve sensor has a sensitivity that is
3 reduced from a sensitivity of the magnetic disk head spin
4 valve sensor by increasing an effective anisotropy field

Docket No. 00-113-TAP

5 of a free layer in a magnetic disk head spin valve
6 sensor.

1 5. The apparatus of claim 4, wherein the effective
2 anisotropy field of the magnetic disk head spin valve
3 sensor is increased by increasing a stiffness of a free
4 layer of the magnetic disk head spin valve sensor.

1 6. The apparatus of claim 5, wherein the stiffness of
2 the free layer is increased by using at least one
3 permanent magnet stabilizing element to impart a
4 stiffening magnetic field to the free layer.

1 7. The apparatus of claim 6, wherein the at least one
2 permanent magnet stabilizing element is a cobalt-
3 platinum-chromium magnet.

1 8. The apparatus of claim 5, wherein the stiffness of
2 the free layer is increased by using an antiferromagnet
3 to impart a stiffening magnetic field to the free layer.

1 9. The apparatus of claim 5, wherein the stiffness of
2 the free layer is increased by using both an
3 antiferromagnet and at least one permanent magnet
4 stabilizing element to impart a stiffening exchange
5 magnetic field to the free layer.

1 10. The apparatus of claim 3, wherein the thickness of
2 the free layer is increased above 60A.

Docket No. 00-113-TAP

1 11. The apparatus of claim 3, wherein the thickness of
2 the free layer is increased to between 90Å and 120Å,
3 inclusively.

12. The apparatus of claim 1, wherein the reduced sensitivity spin valve sensor has a sensitivity that is reduced from a sensitivity of the magnetic disk head spin valve sensor by using a dual type spin valve sensor in which an input flux is distributed across two free layers.

1 13. The apparatus of claim 12, wherein the dual type
2 spin valve sensor has four ferromagnetic material layers
3 spaced from one another by three non-magnetic spacers.

1 14. The apparatus of claim 13, wherein an outer two of
2 the four ferromagnetic material layers have fixed
3 magnetization directions, and wherein an inner two of the
4 four ferromagnetic material layers are free layers.

1 15. The apparatus of claim 1, wherein the reduced
2 sensitivity spin valve sensor has a sensitivity that is
3 reduced from a sensitivity of the magnetic disk head spin
4 valve sensor by reducing the space between the spin valve
5 sensor and a magnetic shield to thereby, reduce a flux
6 injection efficiency of the magnetic disk head spin valve
7 sensor.

1 16. The apparatus of claim 1, wherein the reduced
2 sensitivity spin valve sensor has a sensitivity that is
3 reduced from a sensitivity of the magnetic disk head spin
4 valve sensor by providing two spin valve sensor elements

Docket No. 00-113-TAP

5 in a yoke structure of the head to thereby, distribute an
6 input flux across the two spin valve sensor elements.

1 17. A method of using a spin valve sensor to read data
2 from a magnetic tape media, comprising:
3 passing a magnetic tape media before a magnetic tape
4 media head; and
5 sensing an applied magnetic field from the magnetic
6 tape media using a spin valve sensor, the spin valve
7 sensor having a reduced sensitivity for use with magnetic
8 tape media.

1 18. The method of claim 17, wherein the spin valve
2 sensor has a sensitivity that is reduced by one of
3 reducing a basic magnetic sensitivity of the spin valve
4 sensor, increasing a flux carrying capacity of the spin
5 valve sensor, and reducing a flux injection efficiency of
6 the spin valve sensor.

1 19. The method of claim 17, wherein the spin valve
2 sensor has a sensitivity that is reduced by increasing a
3 thickness of a free layer of the spin valve sensor.

1 20. The method of claim 17, wherein the spin valve
2 sensor has a sensitivity that is reduced by increasing an
3 effective anisotropy field.

1 21. The method of claim 20, wherein the anisotropy field
2 is increased by increasing a stiffness of a free layer of
3 the spin valve sensor.

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Docket No. 00-113-TAP

1 22. The method of claim 21, wherein the stiffness of the
2 free layer is increased by using at least one permanent
3 magnet stabilizing element to impart a stiffening
4 magnetic field to the free layer.

1 23. The method of claim 22, wherein the at least one
2 permanent magnet stabilizing element is a cobalt-
3 platinum-chromium magnet.

1 24. The method of claim 21, wherein the stiffness of the
2 free layer is increased by using an antiferromagnet to
3 impart a stiffening magnetic field to the free layer.

1 25. The method of claim 21, wherein the stiffness of the
2 free layer is increased by using both an antiferromagnet
3 and at least one permanent magnet stabilizing element to
4 impart a stiffening exchange magnetic field to the free
5 layer.

1 26. The method of claim 19, wherein the thickness of the
2 free layer is increased above 60A.

1 27. The method of claim 19, wherein the thickness of the
2 free layer is increased to between 90A and 120A,
3 inclusively.

1 28. The method of claim 17, wherein the spin valve
2 sensor has a sensitivity that is reduced by using a dual
3 type spin valve sensor in which an input flux is
4 distributed across two free layers.

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Docket No. 00-113-TAP

1 29. The method of claim 28, wherein the dual type spin
2 valve sensor has four ferromagnetic material layers
3 spaced from one another by three non-magnetic spacers.

1 30. The method of claim 29, wherein an outer two of the
2 four ferromagnetic material layers have fixed
3 magnetization directions, and wherein an inner two of the
4 four ferromagnetic material layers are free layers.

31. The method of claim 17, wherein the spin valve sensor has a sensitivity that is reduced by reducing a space between the spin valve sensor and a magnetic shield to thereby, reduce a flux injection efficiency of the spin valve sensor.

1 32. The method of claim 17, wherein the spin valve
2 sensor has a sensitivity that is reduced by providing two
3 spin valve sensor elements in a yoke structure of the
4 head to thereby, distribute an input flux across the two
5 spin valve sensor elements.